CHAPTER 8

BARLEY PEARLERS

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1. INTRODUCTION

Barley pearlers are machines used to dehull barley in order to facilitate the determination of heat damaged kernels (major and minor) and kernel texture. For official purposes, only use barley pearlers that are a type and model approved by FGIS; (2) maintained in good operating condition; (3) standardized prior to operating; and (4) tested and examined at the prescribed time, in the proper manner, and found to be within tolerance.

NOTE: Barley pearlers that are used exclusively to dehull sunflower seeds need not be tested.

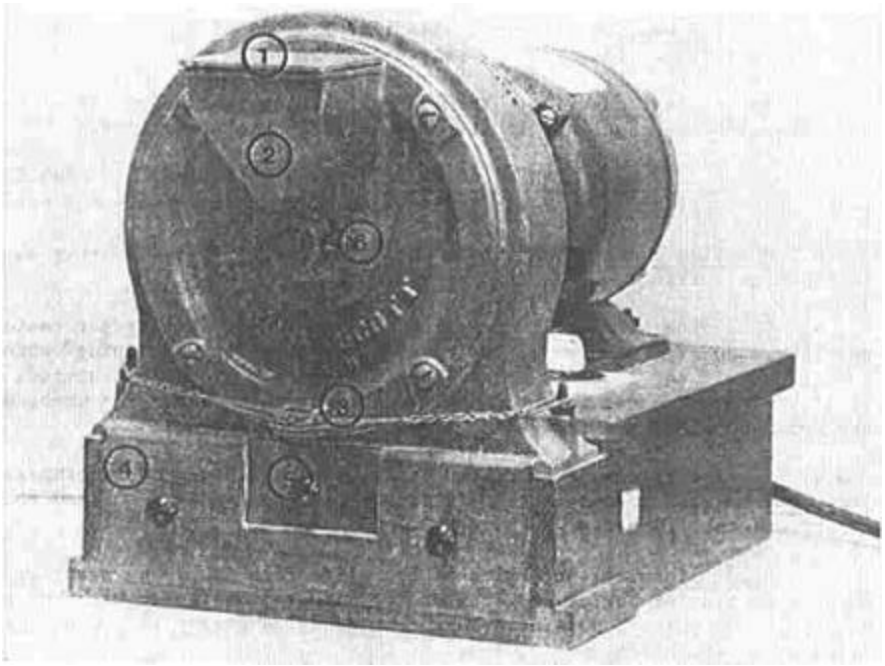

Figure 1, Barley Pearler - Overview

1. Funnel Lid
2. Funnel
3. Slide
4. Hull Drawer
5. Pearled Portion Drawer
6. Oil Cup

2. TOLERANCES

a. Timer Accuracy. For settings of 0 to 60 seconds ± 5 seconds
61 to 90 seconds ..... ± 7 seconds
over 90 seconds.....± 10 seconds

b. Pearling Accuracy. ± 1.0 gram, mean deviation from the standard barley pearler using barley.

3. MAINTENANCE AND ALIGNMENT

Barley pearlers must be maintained in good operating condition. Check and adjust them prior to initial use and periodically thereafter, as needed. Each maintenance check shall encompass the following:

a. Pearler bearing oil cups. Add l or 2 drops of light machine oil. Do not over lubricate.

b. Motor shaft coupling. Examine for slippage and wear. If excessively worn, replace the coupling; if slipping, tighten the Allen screws.

c. Motor alignment with wheel shaft. Check alignment. If misaligned, loosen the motor mounting bolts and realign by adjusting the motor position.

d. Pearling chamber bearings. Check for wear. If excessively worn, replace the bearings.

e. Wire mesh screen. Check screen for proper size and imperfections. Only 8 x 8 mesh-per-inch, 18 gage screen shall be used. If it is not the proper size and free of imperfections, replace it.

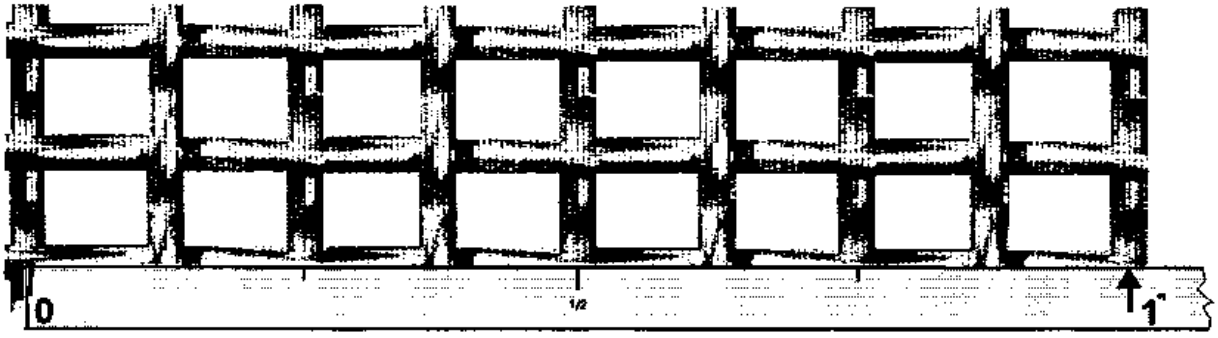

Figure 2, Eight Mesh-Per-Inch Screen

f. Centering of wheel in pearling chamber. Check for proper centering by pearling a 50-gram portion of barley and listening for a "popping" sound during operation. If the sound is heard, the wheel is not properly centered. Adjust by loosening setscrews in motor shaft coupling, then center the wheel within the metal housing, and retighten.

g. Inner surfaces of funnel. Check for cleanliness and smoothness. If dirty, clean with a damp cloth. If rough, file or sand the surface to remove imperfections.

h. Slide closure. Determine if the slide fits snugly by pearling a 50-gram portion of barley and looking for unhulled barley in with the pearled barley in the pearled portion drawer. If unhulled barley is found, realign the slide or refit.

i. General operation. Listen to the pearler during its operation; it should be smooth and quiet. If noisy, recheck the aforementioned items.

j. Support and Power Cord. Check the support for stability and the cord for wear. The electrical wiring under the timer must be covered or otherwise guarded from accidental contact.

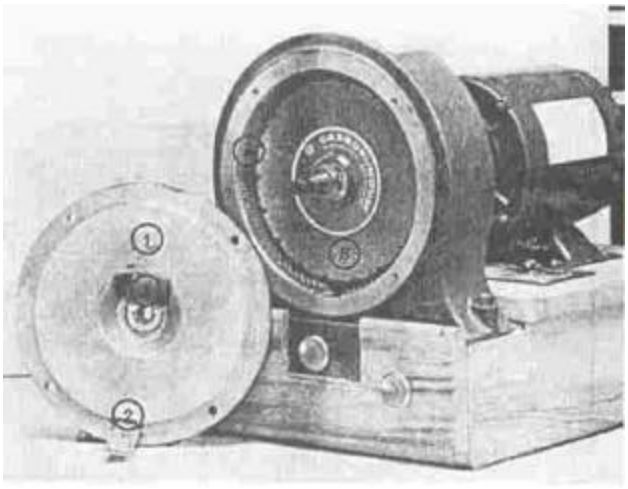

Figure 3, Pearling Chamber

1. Front Plate 2. Slide 3. Funnel 4. Screen 5. Carborundum Wheel

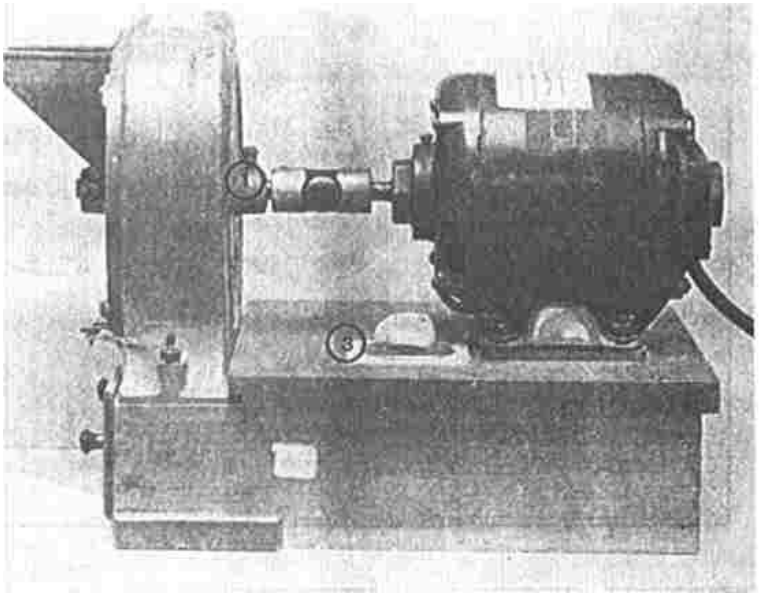

Figure 4, Motor Assembly

1. Pearler Chamber Bearings 2. Motor Shaft Coupling 3. Timer Switch

4. STANDARDIZATION

a. General. After the maintenance and alignment checks on a new pearler have been performed and all appropriate adjustments have been made, the pearler's standardized pearling time shall be established.

b. Standardization Procedures. To standardize a field office or agency device, the field office shall prepare two 50.00-gram samples. Two-rowed barley is preferred for standardization purposes because it is more uniform than 6-rowed barley. However, if a good quality 6-rowed barley is available, it may be used (i.e., sound kernels, recent crop, and fresh).

(1) Pearl one sample using the field office Standard as follows:

(a) Turn the pearler on and open the slide to ensure that the pearling chamber is empty. Then turn the pearler off. After the motor stops, remove and clean the hull and pearler drawers.

(b) Replace the drawers, pour the sample into the hopper, and then replace the hopper lid.

(c) Set the pearler for 2 minutes and activate. When the pearler has run for its standardized pearling time, pull out the slide, allow the pearled barley to drop into the drawer, then allow the machine to continue to run for the final time to clean the chamber.

(d) Weigh the pearled portion and note the results.

(2) Pearl the other sample using the new pearler as follows:

Note: The Carborundum wheel on new pearlers requires a conditioning period. To accomplish this, pearl 20 or more 50-gram portions for 2 minutes each, then proceed with the standardization procedure.

(a) Pour the sample into the hopper and replace the lid.

(b) Set the pearler for 2 minutes and activate. When the pearler has run for l minute, pull out the slide and allow the pearled barley to drop into the drawer. Allow the machine to continue to run for the final minute to clean the chamber.

(c) Weigh the pearled portion and note the results. If the new pearler's pearled portion weighs within plus or minus 1-gram of the results determined by the field office Standard, the new pearler is standardized. If not, the pearling time should be adjusted by ¼ minute increments and retested until a time is established that will yield the correct weight. Increase the pearling time to decrease weight; decrease the pearling time to increase weight.

(3) Standardized Pearling Time Record. After the standardized pearling time is established, record it on a 2-inch by 4-inch piece of paper and tape this to the pearler in a conspicuous place. The standardized pearling time assigned to pearlers shall be based on ¼ minute intervals; e.g., l ¼.

5. TESTING

a. General. Test each barley pearler according to the testing schedule (periodic tests) and whenever the accuracy of the pearler is in question, including after all repairs (supplemental tests).

b. The testing office (FGIS Headquarters, in the case of field office Standard pearlers, or the field office in the case of all other pearlers) shall prepare 50.00-gram, dockage and thin-free test samples from an identified lot of barley. One set of five test samples shall be provided for testing the pearler in question and the duplicate set of five samples shall be provided for testing by the Headquarters or field office Standard, as applicable. Each test sample shall be pearled in accordance with the test procedures.

c. Test Procedures.

(1) Testing the Pearler's Timer.

(a) Set the pearler's timer for its standardized time. Release the timer switch and simultaneously activate a stopwatch. When the timer stops, stop the stopwatch and note the time.

(b) If the time is in excess of the established tolerance, the timer shall be repaired or replaced. Out-of-tolerance timers shall not be retested unless, in the opinion of the testing office, action suitable to correct the problem has been taken.

(2) Testing the Pearling Accuracy.

(a) Thoroughly clean the pearler. Then, with the pearling chamber slide closed, pour a 50.00-gram test sample into the pearling chamber and replace the funnel lid.

(b) Do not use the machine's timer in testing, except to start the pearler. Use a stopwatch for the timing of tests, since it is more accurate than the machine's timing device.

1) Set the timing device to run longer than the established pearling time and activate. Start the stopwatch simultaneously.

2) Pearling time starts when motor starts and ends when the slide gate is opened. The excess time set on the

timer should ensure that the barley will clear the pearling chamber after the slide gate is opened. Take precaution that the slide gate does not vibrate open during the pearling process.

(c) When the pearling time ends, open the slide gate and allow the machine to continue to operate until the timer stops. After the pearler stops, remove the pearler drawer and the hull drawer. Weigh the pearled barley on a scale capable of indicating weight to 0.01 gram. Run the other 50.00-gram samples in the same manner and record the three median results on a form FGIS-924. Drop the lowest and highest results.

(d) Return the pearled barley and barley hulls to FGIS Headquarters or the field office, as appropriate, in separate containers properly identified by sample number and pearling time. Include a properly completed form FGIS-924.

(e) Upon receipt of the returned forms, FGIS Headquarters or the FGIS field office, as appropriate, shall evaluate the test results. If the average of the test results is within ± 1.0 gram of the average weight of the testing office Standard pearler's results, and the appearance of the test and Standard portions are the same, the pearler is acceptable.

(f) In the case of out-of-tolerance equipment, document by notation on the form FGIS-924 all pertinent facts and actions (including adjustments, retests, and follow up action).

(g) After evaluating the test results, the original form FGIS-924 shall be returned to the test unit operator. A copy of the form FGIS-924 shall be retained by FGIS Headquarters or the FGIS field office, as appropriate.

UNITED STATES DEPARTMENT OF AGRICULTURE
Grain Inspection, Packers and Stockyards Administration
Federal Grain Inspection Service

BARLEY PEARLER AND SIEVE TEST

NOTE: TEST UNIT OPERATOR - FILL IN SHADED AREAS ONLY.

DATE MAILED (1)	FIELD OFFICE (2)	AGENCY (3)	LOCATION (4)
9-6-96	Grand Forks		Grand Forks, ND

SIEVE TEST

INSTRUCTIONS:

(1) Read Chapter 9 of Equipment Handbook. (2) Clean, level and oil sieve shaker before starting. (3) Inspect sieves for condition; if sieving surfaces are dirty, loose or bowed. refer to the sieve maintenance section of Chapter 9.

TEST SIEVE RESULTS

SIEVING METHOD: ☐ HAND ☐ MECHANICAL

SIEVE NO.	SIEVE TYPE	SIEVE SIZE	GRAMS SIEVED OUT: FIRST SIEVING	SECOND SIEVING	THIRD SIEVING	AVG. PERCENT

RESULTS BY: DATE

REMARKS

STANDARD SIEVE RESULTS

SIEVING METHOD: ☐ HAND ☐ MECHANICAL

SIEVE NO.	SIEVE TYPE	SIEVE SIZE	GRAMS SIEVED OUT: FIRST SIEVING	SECOND SIEVING	THIRD SIEVING	AVG. PERCENT

RESULTS BY: DATE

SUMMARY OF RESULTS

TEST SIEVE RESULTS	STANDARD SIEVE RESULTS	DEVIATION FROM STANDARD	TOLERANCE ALLOWED: IN	TOLERANCE ALLOWED: OUT

RESULTS BY: DATE

BARLEY PEARLER TEST

INSTRUCTIONS: *(1) Read Chapter 8 of Equipment Handbook. (2) Clean, oil, and make necessary adjustments before starting. (3) Use a stopwatch or other accurate timing device for testing. (4) Drop sample into pearling chamber before starting motor. (5) Start pearler and timer at same time. (6) Pull slide to empty pearling chamber when assigned pearling time has elapsed. Grain should clear pearling chamber before motor is switched off.*

TEST PEARLER RESULTS

PEARLING TIME 1 MIN. 15 SEC.

TEST PEARLER NUMBER	FIRST PEARL	SECOND PEARL	THIRD PEARL	AVERAGE RESULTS
#112 (6)	34.80	34.75 (7)	34.71	34.75 (8)

RESULTS BY: (18) DATE 9-11-96 (19)

REMARKS

STANDARD PEARLER RESULTS

PEARLING TIME 1 MIN. 0 SEC.

TEST PEARLER NUMBER	FIRST PEARL	SECOND PEARL	THIRD PEARL	AVERAGE RESULTS
#A (9)	34.79	34.99	34.84 (10)	34.87 (11)

RESULTS BY: (20) DATE 9-6-96 (21)

SUMMARY OF RESULTS

TEST PEARLER RESULTS (12)	STANDARD PEARLER RESULTS (13)	DEVIATION FROM STANDARD (14)	TOLERANCE ALLOWED (15)	TOLERANCE ALLOWED: IN (16)	TOLERANCE ALLOWED: OUT	TIMER DEVIATION-Tolerance: IN (17)	TIMER DEVIATION-Tolerance: OUT
34.8	34.9	-0.1	± 1.0	✓		✓	

RESULTS BY: DATE 9-12-96 (23)

RECOMMENDED ACTION (22)

☒ KEEP IN SERVICE (24) ☐ RETEST (25) ☐ REPAIR

FORM FGIS-924 (SEP 95)

FORM FGIS-924, "BARLEY PEARLER AND SIEVE TEST"

INSTRUCTIONS FOR COMPLETING FORM FGIS-924, "BARLEY PEARLER AND SIEVE TEST"

l Date the test samples and form FGIS-924 are mailed to the FGIS field office or agency.

2 FGIS field office that performed the test, when applicable.

3 Agency that performed the test, when applicable.

4 Location of the field office or agency that performed the test.

5 The standardized pearling times for the test pearler and the Standard pearler.

6 Test pearler's serial number.

7 Three median test results, shown to 0.01 gram.

8 Average of the three test results, shown to 0.01 gram.

9 Standard pearler's serial number.

10 Three median test results, shown to 0.01 gram.

11 Average of the three test results, shown to 0.01 gram.

12 Average of the test pearler's results (see 8).

13 Average of the Standard pearler's results (see 11).

14 The difference between the average test pearler's and the average Standard pearler's results (see 12 and 13). Show any plus or minus deviation from the Standard, including the appropriate sign.

15 "1.0" gram.

16 Indicate whether the test pearler is in tolerance (mean deviation from Standard of 1.0 gram or less) or out of tolerance (mean deviation from Standard of more than 1.0 gram).

17 Indicate whether the test pearler's timer is in or out of tolerance.

18 Name of person who tested the test pearler.

19 Date that testing of the test pearler was completed.

20 Name of person who tested the Standard pearler.

21 Date that testing of the Standard pearler was completed.

22 Name of person who determined whether the test pearler was or was not in tolerance.

23 Date the determination was completed.

24 Remarks.

25 Recommended action.